

```
=> fil reg
FILE 'REGISTRY' ENTERED AT 10:11:46 ON 19 NOV 2008
USE IS SUBJECT TO THE TERMS OF YOUR STN CUSTOMER AGREEMENT.
PLEASE SEE "HELP USAGETERMS" FOR DETAILS.
COPYRIGHT (C) 2008 American Chemical Society (ACS)
```

Property values tagged with IC are from the ZIC/VINITI data file provided by InfoChem.

STRUCTURE FILE UPDATES: 18 NOV 2008 HIGHEST RN 1073232-10-6  
 DICTIONARY FILE UPDATES: 18 NOV 2008 HIGHEST RN 1073232-10-6

New CAS Information Use Policies, enter HELP USAGETERMS for details.

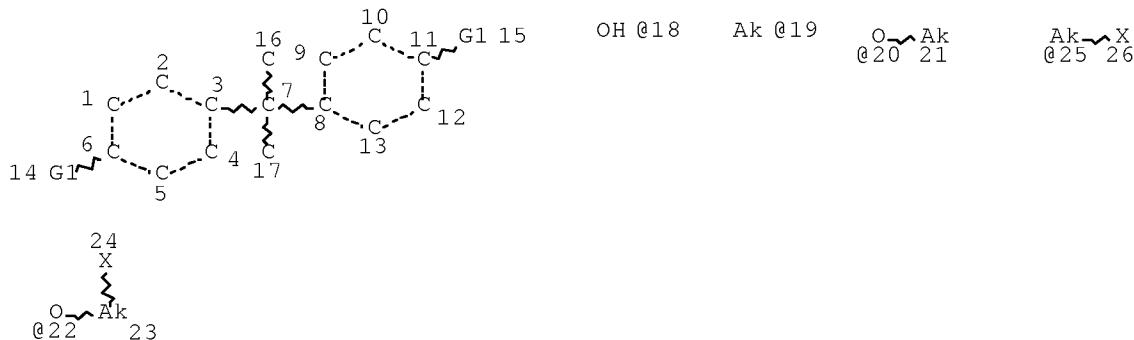
TSCA INFORMATION NOW CURRENT THROUGH July 5, 2008.

Please note that search-term pricing does apply when conducting SmartSELECT searches.

REGISTRY includes numerically searchable data for experimental and predicted properties as well as tags indicating availability of experimental property data in the original document. For information on property searching in REGISTRY, refer to:

<http://www.cas.org/support/stngen/stndoc/properties.html>

```
=> d que stat 14
L3          STR
```



VAR G1=18/19/20/25/22

NODE ATTRIBUTES:

```
NSPEC  IS RC      AT  16
NSPEC  IS RC      AT  17
CONNECT IS E1  RC AT  19
CONNECT IS E1  RC AT  21
DEFAULT MLEVEL IS ATOM
DEFAULT ECLEVEL IS LIMITED
ECOUNT  IS M2 C   AT  19
```

GRAPH ATTRIBUTES:

```
RSPEC   8   3
NUMBER OF NODES IS  26
```

STEREO ATTRIBUTES: NONE

```
L4          45072 SEA FILE=REGISTRY SSS FUL L3
```

100.0% PROCESSED 220380 ITERATIONS  
 SEARCH TIME: 00.00.04

45072 ANSWERS

=> d his nofile

(FILE 'HOME' ENTERED AT 09:20:34 ON 19 NOV 2008)

FILE 'HCAPLUS' ENTERED AT 09:20:47 ON 19 NOV 2008

L1 1 SEA ABB=ON PLU=ON US20040185347/PN  
 SEL RN

FILE 'REGISTRY' ENTERED AT 09:21:06 ON 19 NOV 2008

L2 54 SEA ABB=ON PLU=ON (463-79-6/BI OR 10377-51-2/BI OR  
 105-58-8/BI OR 108-32-7/BI OR 108-88-3/BI OR 117-80-6/BI  
 OR 1192-62-7/BI OR 1193-79-9/BI OR 126-33-0/BI OR  
 127-63-9/BI OR 131651-65-5/BI OR 13243-65-7/BI OR  
 1330-20-7/BI OR 14024-11-4/BI OR 14283-07-9/BI OR  
 162684-16-4/BI OR 16851-82-4/BI OR 18424-17-4/BI OR  
 1889-59-4/BI OR 21324-40-3/BI OR 271-89-6/BI OR 27359-10-  
 0/BI OR 28122-14-7/BI OR 28452-93-9/BI OR 29935-35-1/BI  
 OR 33454-82-9/BI OR 35363-40-7/BI OR 3680-02-2/BI OR  
 37220-89-6/BI OR 39300-70-4/BI OR 4265-27-4/BI OR  
 4437-85-8/BI OR 462-06-6/BI OR 524-42-5/BI OR 5535-43-3/B  
 I OR 5535-48-8/BI OR 56525-42-9/BI OR 616-38-6/BI OR  
 620-32-6/BI OR 623-53-0/BI OR 623-96-1/BI OR 625-86-5/BI  
 OR 67-71-0/BI OR 693-98-1/BI OR 71-43-2/BI OR 7439-93-2/B  
 I OR 7447-41-8/BI OR 7474-83-1/BI OR 77-77-0/BI OR  
 7791-03-9/BI OR 80-05-7/BI OR 90076-65-6/BI OR 95-15-8/BI  
 OR 96-49-1/BI)  
 D COST  
 D SAV  
 ACT WEI27201/A

-----

L3 STR

L4 45072 SEA SSS FUL L3

-----

L5 1 SEA ABB=ON PLU=ON L2 AND L4  
 D SCA

FILE 'HCAPLUS' ENTERED AT 09:23:10 ON 19 NOV 2008

L6 QUE ABB=ON PLU=ON ELECTROLYTE  
 L7 299 SEA ABB=ON PLU=ON L4(L) L6  
 L8 QUE ABB=ON PLU=ON (LI OR LITHIUM) (2A) SALT  
 L9 13 SEA ABB=ON PLU=ON L7 AND L8  
 L10 QUE ABB=ON PLU=ON LI OR LITHIUM  
 L11 QUE ABB=ON PLU=ON WEIGHT OR WT# OR MASS##  
 L12 48 SEA ABB=ON PLU=ON L7 AND L11  
 L13 QUE ABB=ON PLU=ON 0(W)(01 OR 02 OR 03 OR 04 OR 05 OR 1  
 OR 10 OR 2 OR 20 OR 5 OR 50)  
 L14 15 SEA ABB=ON PLU=ON L12 AND L13  
 D KWIC 1-2  
 L15 QUE ABB=ON PLU=ON 1 OR 2 OR 3 OR 5 OR 10 OR 12 OR 15  
 RO 20  
 L16 15 SEA ABB=ON PLU=ON L14 AND L15  
 D KWIC 1-2  
 L17 QUE ABB=ON PLU=ON L15(5A) L11  
 L18 13 SEA ABB=ON PLU=ON L16 AND L17

L19 2559243 SEA ABB=ON PLU=ON L13(3A)L15  
L20 12 SEA ABB=ON PLU=ON L18 AND L19  
D KWIC 1-2  
L21 QUE ABB=ON PLU=ON (ADDITIVE? OR ADJUVANT? OR AUXILIAR?  
OR MODIF? OR AGENT? OR ELECTROLYTE) (S)L11  
L22 7 SEA ABB=ON PLU=ON L20 AND L21  
D KWIC 1-2  
L23 16316 SEA ABB=ON PLU=ON L5  
L24 5 SEA ABB=ON PLU=ON L23 AND L9  
L25 1 SEA ABB=ON PLU=ON L22 AND L24  
D SCA  
D KWIC  
L26 5 SEA ABB=ON PLU=ON L24 OR L25  
L27 6 SEA ABB=ON PLU=ON L22 NOT L26

=> fil hcap  
FILE 'HCAPLUS' ENTERED AT 10:11:52 ON 19 NOV 2008  
USE IS SUBJECT TO THE TERMS OF YOUR STN CUSTOMER AGREEMENT.  
PLEASE SEE "HELP USAGETERMS" FOR DETAILS.  
COPYRIGHT (C) 2008 AMERICAN CHEMICAL SOCIETY (ACS)

Copyright of the articles to which records in this database refer is held by the publishers listed in the PUBLISHER (PB) field (available for records published or updated in Chemical Abstracts after December 26, 1996), unless otherwise indicated in the original publications. The CA Lexicon is the copyrighted intellectual property of the American Chemical Society and is provided to assist you in searching databases on STN. Any dissemination, distribution, copying, or storing of this information, without the prior written consent of CAS, is strictly prohibited.

FILE COVERS 1907 - 19 Nov 2008 VOL 149 ISS 21  
FILE LAST UPDATED: 18 Nov 2008 (20081118/ED)

HCAPLUS now includes complete International Patent Classification (IPC) reclassification data for the third quarter of 2008.

New CAS Information Use Policies, enter HELP USAGETERMS for details.

This file contains CAS Registry Numbers for easy and accurate substance identification.

=> d ibib abs hitstr hitind 126 1-5

L26 ANSWER 1 OF 5 HCAPLUS COPYRIGHT 2008 ACS on STN  
ACCESSION NUMBER: 2005:394066 HCAPLUS Full-text  
DOCUMENT NUMBER: 142:433099  
TITLE: Electrolyte for rechargeable lithium battery  
INVENTOR(S): Kim, Jin-Hee; Kim, Jin-Sung  
PATENT ASSIGNEE(S): Samsung SDI Co., Ltd., S. Korea  
SOURCE: Eur. Pat. Appl., 50 pp.  
CODEN: EPXXDW  
DOCUMENT TYPE: Patent  
LANGUAGE: English  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
------------	------	------	-----------------	------

EP 1528616	A2	20050504	EP 2004-90417	200411	01
EP 1528616	A3	20070103			
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, PL, SK, HR, IS, YU					
KR 2005041859	A	20050504	KR 2004-65773	200408	20
JP 2005142157	A	20050602	JP 2004-318586	200411	01
US 20050142448	A1	20050630	US 2004-980116	200411	01
CN 1770541	A	20060510	CN 2004-10104744	200411	01
PRIORITY APPLN. INFO.:			KR 2003-76913	A	200310
				31	
			KR 2004-65773	A	200408
				20	

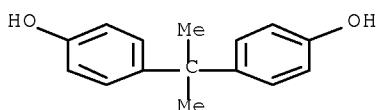
OTHER SOURCE(S): MARPAT 142:433099

AB Disclosed is an electrolyte for a rechargeable lithium battery including: a first additive having an oxidation potential of 4.1 to 4.6 V; a second additive having an oxidation potential of 4.4 to 5.0 V; and a nonaq. organic solvent; and a lithium salt.

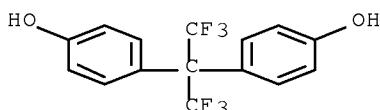
IT 80-05-7, Bisphenol A, uses 1478-61-1,  
4, 4'-(Hexafluoroisopropylidene)diphenol  
RL: MOA (Modifier or additive use); USES (Uses)  
(electrolyte for rechargeable lithium battery)

RN 80-05-7 HCAPLUS

CN Phenol, 4, 4'-(1-methylethylidene)bis- (CA INDEX NAME)



RN 1478-61-1 HCAPLUS  
CN Phenol, 4, 4'-(2,2,2-trifluoro-1-(trifluoromethyl)ethylidene)bis- (CA INDEX NAME)



IC ICM H01M010-40  
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
 Section cross-reference(s): 38  
 IT 79-41-4D, Methacrylic acid, copolymer with methacrylic alkyl ester  
 80-05-7, Bisphenol A, uses 80-09-1, Bisphenol S  
 106-38-7, 4-Bromotoluene 106-43-4, 4-Chlorotoluene 115-07-1D,  
 Propylene, copolymer with C2-8 olefin 352-32-9, 4-Fluorotoluene  
 530-48-3, 1,1-Diphenyl ethylene 772-00-9, 4-Phenyl-1,3-dioxane  
 843-55-0, 4,4'-Cyclohexylidene bisphenol 1075-20-3,  
 4-Phenyl-1,3-dioxolane 1478-61-1,  
 4,4'-(Hexafluoroisopropylidene)diphenol 9000-11-7 9003-39-8,  
 Polyvinylpyrrolidone 9004-34-6D, Cellulose, compds. 9004-57-3,  
 Ethyl cellulose 9004-62-0 9004-64-2, Hydroxypropyl cellulose  
 9004-65-3, Hydroxypropyl methyl cellulose 9004-67-5, Methyl  
 cellulose 9062-14-0, Ethyl hydroxypropyl cellulose 10192-62-8,  
 Bisphenol A diacetate 24937-79-9, PVDF 25549-84-2, Polysodium  
 acrylate  
 RL: MOA (Modifier or additive use); USES (Uses)  
 (electrolyte for rechargeable lithium battery)

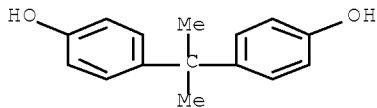
L26 ANSWER 2 OF 5 HCPLUS COPYRIGHT 2008 ACS on STN  
 ACCESSION NUMBER: 2004:932030 HCPLUS Full-text  
 DOCUMENT NUMBER: 141:398152  
 TITLE: Electrolyte solution for secondary lithium  
 battery and the battery  
 INVENTOR(S): Kim, Jin Hee; Kim, Jin Sung; Hwang, Sang Moon;  
 Baek, Ho Sung; Kim, Hak Soo  
 PATENT ASSIGNEE(S): Samsung SDI Co., Ltd., S. Korea  
 SOURCE: Jpn. Kokai Tokkyo Koho, 19 pp.  
 CODEN: JKXXAF  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Japanese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2004311442	A	20041104	JP 2004-111392	200404 05
KR 2004086920	A	20041013	KR 2003-21110	200304 03
US 20040259002	A1	20041223	US 2004-817761	200404 02
CN 1540794	A	20041027	CN 2004-10038747	200404 05
PRIORITY APPLN. INFO.:			KR 2003-21110	A 200304 03

AB The electrolyte solution contains a Li salt, a nonaq. organic solvent, and an additive having a decomposition starting voltage 4-5 V and a constant current in a  $\geq 0.5$  V wide range on its linear sweep voltammogram. The additive is selected from bisphenol A, 2,5-dimethylfuran, 2,3-dichloro-1,4-naphthoquinone.

The battery has suppressed gas formation when stored at high temps., and has improved safety when overcharged.

IT 80-05-7, Bisphenol A, uses  
 RL: MOA (Modifier or additive use); USES (Uses)  
 (additives in electrolyte solns. in secondary lithium batteries for safety and high temperature storing performance)  
 RN 80-05-7 HCPLUS  
 CN Phenol, 4, 4'-(1-methylethylidene)bis- (CA INDEX NAME)



IC ICM H01M010-40  
 ICS H01M004-02; H01M004-58  
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
 IT 80-05-7, Bisphenol A, uses 117-80-6,  
 2,3-Dichloro-1,4-naphthoquinone 625-86-5, 2,5-Dimethylfuran  
 RL: MOA (Modifier or additive use); USES (Uses)  
 (additives in electrolyte solns. in secondary lithium batteries for safety and high temperature storing performance)

L26 ANSWER 3 OF 5 HCPLUS COPYRIGHT 2008 ACS on STN  
 ACCESSION NUMBER: 2004:796490 HCPLUS Full-text  
 DOCUMENT NUMBER: 141:263480  
 TITLE: A nonaqueous electrolyte for a lithium secondary battery  
 INVENTOR(S): Noh, Hyeong-Gon; Jung, Cheol-Soo; Song, Eui-Hwan  
 PATENT ASSIGNEE(S): Samsung SDI Co., Ltd., S. Korea  
 SOURCE: Eur. Pat. Appl., 25 pp.  
 CODEN: EPXXDW  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 1463143	A2	20040929	EP 2003-90265	200308 21
EP 1463143	A3	20080416		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, SK				
KR 2004083670	A	20041006	KR 2003-18226	200303 24
JP 2005108440	A	20050421	JP 2003-183257	200306 26
CN 1532986	A	20040929	CN 2003-155677	200309 02
US 20040197667	A1	20041007	US 2003-653192	

US 7223500  
PRIORITY APPLN. INFO.:

B2 20070529

KR 2003-18226

A

200309  
03  
200303  
24

OTHER SOURCE(S): MARPAT 141:263480

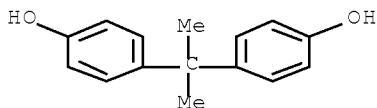
AB An electrolyte of a lithium secondary battery includes lithium salts, an organic solvent with a high b.p., and a carbonate-based additive compound having substituents selected from the group consisting of a halogen, a CN, and a NO<sub>2</sub>. The electrolyte improves discharge, low temperature, and cycle life characteristics of a lithium secondary battery.

IT 80-05-7, uses

RL: MOA (Modifier or additive use); USES (Uses)  
(nonaq. electrolyte for lithium secondary battery)

RN 80-05-7 HCAPLUS

CN Phenol, 4,4'-(1-methylethylidene)bis- (CA INDEX NAME)



IC ICM H01M010-40

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

IT 67-71-0, Methyl sulfone 77-77-0, Vinyl sulfone 80-05-7,  
uses 104-92-7, 4-Bromoanisole 127-63-9, Phenyl sulfone  
452-10-8, 2,4-Difluoroanisole 456-49-5, 3-Fluoroanisole  
459-60-9, 4-Fluoroanisole 463-79-6D, Carbonic acid, cyclic ester  
620-32-6, Benzyl sulfone 623-12-1, 4-Chloroanisole 1073-05-8,  
1,3-Propanediol cyclic sulfate 1120-71-4, Propane sultone  
1888-91-1, n-Acetylcaprolactam 1889-59-4, Ethyl vinyl sulfone  
2398-37-0, 3-Bromoanisole 2845-89-8, 3-Chloroanisole 3680-02-2,  
Methyl vinyl sulfone 5535-48-8, Phenyl vinyl sulfone 24937-79-9,  
Pvdf 28452-93-9, Butadiene sulfone 28802-49-5, Dimethylfuran  
93343-10-3, 3,5-Difluoroanisole 114435-02-8, Fluoroethylene  
carbonate 202925-08-4, 3-Chloro-5-fluoroanisole 756901-22-1  
756901-23-2RL: MOA (Modifier or additive use); USES (Uses)  
(nonaq. electrolyte for lithium secondary battery)

L26 ANSWER 4 OF 5 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2004:753254 HCAPLUS Full-text

DOCUMENT NUMBER: 141:228183

TITLE: A nonaqueous electrolyte for lithium secondary  
batteryINVENTOR(S): Kim, Jin-Hee; Kim, Jin-Sung; Hwang, Sang-Moon;  
Paik, Meen-Seon; Kim, Hak-SooPATENT ASSIGNEE(S): Samsung SDI Co., Ltd., S. Korea; Cheil  
Industries Inc.SOURCE: Eur. Pat. Appl., 33 pp.  
CODEN: EPXXDW

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 1458048	A1	20040915	EP 2003-90262	200308 21
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, SK				
KR 2004080775	A	20040920	KR 2003-15749	200303 13
JP 2005108439	A	20050421	JP 2003-183239	200306 26
CN 1531134	A	20040922	CN 2003-155332	200308 27
US 20040185347	A1	20040923	US 2003-658272	200309 10
PRIORITY APPLN. INFO.:			KR 2003-15749	A 200303 13

OTHER SOURCE(S): MARPAT 141:228183

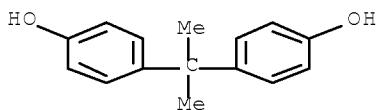
AB An electrolyte for a lithium secondary battery includes lithium salts, a nonaq. organic solvent, and additive compds. The additive compds. added to the electrolyte of the present invention decompose earlier than the organic solvent to form a conductive polymer layer on the surface of a pos. electrode, and prevent decomposition of the organic solvent. Accordingly, the electrolyte inhibits gas generation caused by decomposition of the organic solvent at initial charging, and thus reduces an increase of internal pressure and swelling during high temperature storage, and also improves safety of the battery during overcharge.

IT 80-05-7, Bisphenol A, uses

RL: MOA (Modifier or additive use); USES (Uses)  
(nonaq. electrolyte for lithium secondary battery)

RN 80-05-7 HCPLUS

CN Phenol, 4,4'-(1-methylethylidene)bis- (CA INDEX NAME)



IC ICM H01M010-40

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

IT 80-05-7, Bisphenol A, uses 95-15-8, Thianaphthene

117-80-6, 2,3-Dichloro-1,4-naphthoquinone 271-89-6, 2,3-Benzofuran

524-42-5, 1,2-Naphthoquinone 625-86-5, 2,5-Dimethylfuran

693-98-1, 2-Methylimidazole 1192-62-7, 2-Acetyl furan 1193-79-9,

2-Acetyl-5-methylfuran 4265-27-4, 2-Butylbenzofuran 7474-83-1,

3-Bromo-1,2-naphthoquinone 13243-65-7,

2,3-Dibromo-1,4-naphthoquinone 16851-82-4,

1-(Phenylsulfonyl)pyrrole

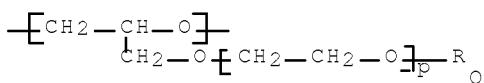
RL: MOA (Modifier or additive use); USES (Uses)  
(nonaq. electrolyte for lithium secondary battery)

REFERENCE COUNT: 10 THERE ARE 10 CITED REFERENCES AVAILABLE  
FOR THIS RECORD. ALL CITATIONS AVAILABLE  
IN THE RE FORMAT

L26 ANSWER 5 OF 5 HCAPLUS COPYRIGHT 2008 ACS on STN  
ACCESSION NUMBER: 1994:151069 HCAPLUS Full-text  
DOCUMENT NUMBER: 120:151069  
ORIGINAL REFERENCE NO.: 120:26353a, 26356a  
TITLE: Ionic conductive polymer electrolytes  
INVENTOR(S): Kono, Michuki; Motogami, Kenji; Mori, Shigeo  
PATENT ASSIGNEE(S): Dai Ichi Kogyo Seiyaku Co Ltd, Japan  
SOURCE: Jpn. Kokai Tokkyo Koho, 10 pp.  
CODEN: JKXXAF  
DOCUMENT TYPE: Patent  
LANGUAGE: Japanese  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 05202281	A	19930810	JP 1992-34368	199201 24
JP 3149247	B2	20010326		
US 6019908	A	20000201	US 1992-998021	199212 29
PRIORITY APPLN. INFO.:			JP 1992-34368	A 199201 24

GI



AB The title electrolytes comprise organic polymers described by the general formula  $Z[(E)m(A)nY]k$  (I; Z = active H-containing compound residue; Y = active H group, polymerizable reactive functional group; k = 1-12; E = Q; p = 0-25; R = C1-20 alkyl, alkenyl, aryl, alkylaryl; A =  $\text{CH}_2\text{CH}_2\text{O}$ ; m = 1-220; n = 1-240; m + n  $\geq$  4; E and A are linked randomly) with average mol. weight 500-50,000 crosslinked either by the reaction of active H-terminated compds. with crosslinkers or by polymerization of functional group-terminated compds., soluble electrolyte salts, and  $\text{gtoreq}1$  organic solvent selected from THF, 2-methyltetrahydrofuran, 1, 3-dioxolane, 4,4-dimethyl-1,3-dioxolane,  $\gamma$ -butyrolactone, ethylene carbonate, sulfolane, 3-methylsulfone (sic), tert-Bu ether, iso-Bu ether, 1, 2-dimethoxyethane, 1,2-ethoxymethoxyethane, and ethylene glycol di-Et ether. Thus, 18 g glycerin was treated with a mixture of 730 g diethylene glycol glycidyl Me ether and 182 g ethylene oxide in the presence of KOH to give 876 g polyether with mol. weight 4700, which was esterified with 1.1 equivalent acrylic acid to give

acrylate-terminated polyether with mol. weight 4862. A solution containing the polyether 3.6, propylene carbonate 3 .6, LiClO<sub>4</sub> 0.4, and 1-hydroxycyclohexyl Ph ketone 0.04 g was cast on a glass plate and UV-irradiated to give a 100  $\mu$ m-thick polymer electrolyte which showed ionic conductivity 9.2 + 10<sup>-4</sup> S/cm at 20°, 5.1 + 10<sup>-4</sup> S/cm at 0°, and 2.5 + 10<sup>-4</sup> S/cm at -20°.

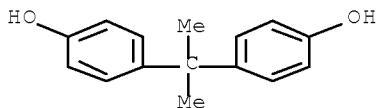
IT 80-05-7DP, Bisphenol A, reaction products with polyoxyethylene glycidyl Me ether and ethylene oxide, p-vinylbenzoates, polymers

RL: PREP (Preparation)

(preparation of, crosslinked, for electrolytes, containing lithium trifluoromethanesulfonate and organic solvents, ionic conductive, stable at low temps.)

RN 80-05-7 HCPLUS

CN Phenol, 4,4'-(1-methylethylidene)bis- (CA INDEX NAME)



IC ICM C08L071-02

ICS C08K003-24; C08K005-00; C08K005-17; C08K005-42; H01B001-06

CC 76-2 (Electric Phenomena)

IT 14283-07-9, Lithium tetrafluoroborate 33454-82-9, Trifluoromethanesulfonic acid lithium salt

RL: USES (Uses)

(electrolytes from crosslinked polyethers containing organic solvents and, ionic conductive, stable at low temps.)

IT 80-05-7DP, Bisphenol A, reaction products with

polyoxyethylene glycidyl Me ether and ethylene oxide, p-vinylbenzoates, polymers 107-21-1DP, Ethylene glycol, reaction products with triethylene glycol Bu glycidyl ether and ethylene oxide, p-vinylbenzoates, polymers 822-06-0DP, Hexamethylene diisocyanate, polymers with hydroxy-terminated polyethers 1075-49-6DP, p-Vinylbenzoic acid, esterification products with hydroxy-terminated polyethers, polymers 4067-16-7DP, Pentaethylenehexamine, reaction products with triethylene glycol glycidyl methyl ether and ethylene oxide, polymers with HDI 40349-67-5DP, Polyoxyethylene glycidyl methyl ether, reaction products with bisphenol A and ethylene oxide, p-vinylbenzoates, polymers 87257-02-1DP, reaction products with ethylene glycol and ethylene oxide, p-vinylbenzoates, polymers

RL: PREP (Preparation)

(preparation of, crosslinked, for electrolytes, containing lithium trifluoromethanesulfonate and organic solvents, ionic conductive, stable at low temps.)

IT 96-47-9, 2-Methyltetrahydrofuran 96-48-0,

$\gamma$ -Butyrolactone 96-49-1, Ethylene carbonate 108-32-7,

Propylene carbonate 109-99-9, Tetrahydrofuran, uses 110-71-4

126-33-0, Sulfolane 534-15-6, 1,1

-Dimethoxyethane 628-55-7, Isobutyl ether 629-14-1, Ethylene glycol diethyl ether 646-06-0, 1,3-Dioxolane

4437-85-8, Butylene carbonate 5137-45-1, 1,2

-Ethoxymethoxyethane 6163-66-2, tert-Butyl ether 13372-33-3,

4,4-Dimethyl-1,3-dioxolane

RL: USES (Uses)  
(solvent, for ionic conductive polymer electrolytes)

=> d ibib abs hitstr hitind 127 1-6

L27 ANSWER 1 OF 6 HCAPLUS COPYRIGHT 2008 ACS on STN  
 ACCESSION NUMBER: 2007:1272637 HCAPLUS Full-text  
 DOCUMENT NUMBER: 147:525330  
 TITLE: Sulfonic acid-containing polyarylene electrode  
 electrolytes for polymer electrolyte fuel cells  
 INVENTOR(S): Yamakawa, Yoshitaka; Nagao, Takashi; Kanaoka,  
 Nagayuki; Nakagawa, Shigeo; Matsuo, Junji  
 PATENT ASSIGNEE(S): Jsr Ltd., Japan; Honda Motor Co., Ltd.  
 SOURCE: Jpn. Kokai Tokkyo Koho, 25pp.  
 CODEN: JKXXAF  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Japanese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
-----	----	-----	-----	
-----				
JP 2007294236	A	20071108	JP 2006-121050	200604 25
PRIORITY APPLN. INFO.:			JP 2006-121050	200604 25

AB The electrode electrolytes comprise (A) ion-conductive polymer segments and (B) ion-nonconductive polymer segments and show  $W + D = 0.2-1.5$  [ $W$  = weight of absorbed unfrozen water (g) when immersed in water at  $90^\circ$  for 30 min and then cooled to  $-20^\circ$ ;  $D$  = self-diffusion coefficient ( $10-10$  m<sup>2</sup>/s) at  $-20^\circ$  of water]. Electrode pastes, electrodes, and membrane-electrode assemblies are also claimed. The electrode electrolytes show good low-temperature power generation in polymer electrolyte fuel cells.

IT 954147-84-3DP, hydrolyzed

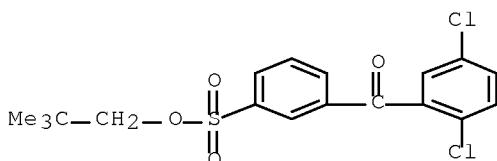
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)  
 (sulfonic acid-containing polyarylene electrode electrolytes for polymer electrolyte fuel cells)

RN 954147-84-3 HCAPLUS

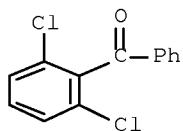
CN Benzenesulfonic acid, 3-(2,5-dichlorobenzoyl)-, 2,2-dimethylpropyl ester, polymer with (2,6-dichlorophenyl)phenylmethanone and 4,4'-(2,2,2-trifluoro-1-(trifluoromethyl)ethylidene)bis[phenol], block (CA INDEX NAME)

CM 1

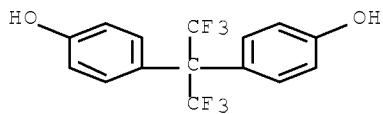
CRN 847972-43-4  
 CMF C18 H18 Cl2 O4 S



CM 2

CRN 50609-23-9  
CMF C13 H8 Cl2 O

CM 3

CRN 1478-61-1  
CMF C15 H10 F6 O2

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
 Section cross-reference(s): 38  
 IT 847972-43-4DP, Neopentyl 3-(2,5-dichlorobenzoyl)benzenesulfonate, block polymers with ion-nonconductive oligomers, hydrolyzed 954147-84-3DP, hydrolyzed 954147-85-4DP, hydrolyzed  
 RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)  
 (sulfonic acid-containing polyarylene electrode electrolytes for polymer electrolyte fuel cells)

L27 ANSWER 2 OF 6 HCPLUS COPYRIGHT 2008 ACS on STN  
 ACCESSION NUMBER: 2007:1240528 HCPLUS [Full-text](#)  
 DOCUMENT NUMBER: 147:489098  
 TITLE: Membrane-electrode assembly and polymer electrolyte fuel cells  
 INVENTOR(S): Nomura, Kimiatsu  
 PATENT ASSIGNEE(S): Fuji Photo Film Co., Ltd., Japan  
 SOURCE: Jpn. Kokai Tokkyo Koho, 29pp.  
 CODEN: JKXXAF  
 DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

## PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2007287675	A	20071101	JP 2007-73204	200703 20
PRIORITY APPLN. INFO.:			JP 2006-76575	A 200603 20

AB The title assembly (MEA) is equipped with an electrolyte membrane containing a sulfonated aromatic polymer containing .gtoreq.1 of sulfonate groups and the membrane is bonded to electrode membranes by heating and/or pressing, where the electrolyte membrane and/or electrode membranes contain 0.1 -20 weight% (to each membrane) good solvent to the sulfonated aromatic polymer. The fuel cell, equipped with the MEA, provides long service life by preventing peeling of the membrane joints.

IT 608146-31-2P

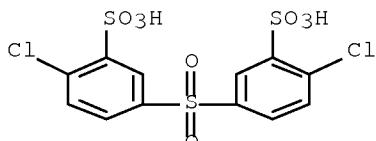
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)  
(electrolyte membrane; membrane-electrode assembly containing sulfonated aromatic polysulfone for polymer electrolyte fuel cells)

RN 608146-31-2 HCPLUS

CN Benzenesulfonic acid, 3,3'-sulfonylbis[6-chloro-, sodium salt (1:2), polymer with 1,1'-sulfonylbis[4-chlorobenzene] and 4,4'-(2,2,2-trifluoro-1-(trifluoromethyl)ethylidene]bis[phenol] (CA INDEX NAME)

CM 1

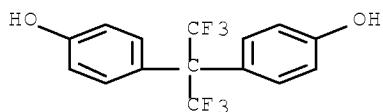
CRN 51698-33-0  
CMF C12 H8 Cl2 O8 S3 . 2 Na



●2 Na

CM 2

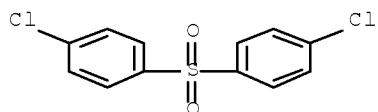
CRN 1478-61-1  
CMF C15 H10 F6 O2



CM 3

CRN 80-07-9

CMF C12 H8 Cl2 O2 S



IT 25154-01-2P

RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)  
 (polymerization and chloromethylation of; membrane-electrode assembly containing sulfonated aromatic polysulfone for polymer electrolyte fuel cells)

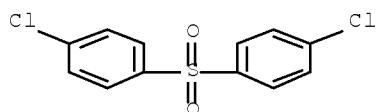
RN 25154-01-2 HCPLUS

CN Phenol, 4,4'-(1-methylethylidene)bis-, polymer with 1,1'-sulfonylbis[4-chlorobenzene] (CA INDEX NAME)

CM 1

CRN 80-07-9

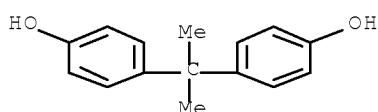
CMF C12 H8 Cl2 O2 S



CM 2

CRN 80-05-7

CMF C15 H16 O2



CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

Section cross-reference(s): 38

IT 25135-51-7DP, chloromethylated, reaction products with mercaptopropanesulfonate 267877-35-0P 608146-31-2P  
 RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)  
 (electrolyte membrane; membrane-electrode assembly containing sulfonated aromatic polysulfone for polymer electrolyte fuel cells)

IT 25135-51-7P 25154-01-2P  
 RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)  
 (polymerization and chloromethylation of; membrane-electrode assembly containing sulfonated aromatic polysulfone for polymer electrolyte fuel cells)

IT 51698-33-0P, Bis(4-chloro-3-sulfophenyl) sulfone disodium salt  
 RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)  
 (preparation and polymerization of; membrane-electrode assembly containing sulfonated aromatic polysulfone for polymer electrolyte fuel cells)

IT 107-30-2, Chloromethyl methyl ether 17636-10-1, Sodium 3-mercaptop-1-propanesulfonate  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (reaction of; membrane-electrode assembly containing sulfonated aromatic polysulfone for polymer electrolyte fuel cells)

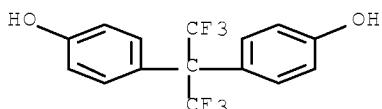
L27 ANSWER 3 OF 6 HCPLUS COPYRIGHT 2008 ACS on STN  
 ACCESSION NUMBER: 2006:926710 HCPLUS Full-text  
 DOCUMENT NUMBER: 146:166181  
 TITLE: Nonaqueous electrolyte based on 4,4'-(hexafluoroisopropylidene)diphenol for lithium batteries comprising organic solvent where lithium salt is dissolved and 4,4'-(hexafluoroisopropylidene)diphenol  
 INVENTOR(S): Kim, Hak Soo; Jeon, Jong Ho; Park, Myoung Kook; Kim, Jong Seob  
 PATENT ASSIGNEE(S): Cheil Industries Inc., S. Korea  
 SOURCE: Repub. Korean Kongkae Taeho Kongbo, No pp. given  
 CODEN: KRXXA7  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Korean  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
-----	----	-----	-----	-----
KR 2005062212	A	20050623	KR 2003-94218	200312 20
PRIORITY APPLN. INFO.:			KR 2003-94218	200312 20

AB This nonaq. electrolyte solution has little thickness expansion during the initial full charge of a battery and little thickness change at high temperature. The nonaq. electrolyte solution comprises 100 parts by weight of an organic solvent, with a Li salt is dissolved by 0.8-2.0 M; and 0.1-10 parts by weight of

4, 4'-(hexafluoroisopropylidene)diphenol. Preferably the organic solvent is a mixture of a cyclic carbonate-based solvent and a linear carbonate-based solvent. Preferably the organic solvent comprises further at least one kind of solvent selected from the group consisting of Pr acetate, MeOAc, EtOAc, BuOAc, Me propionate, Et propionate and fluorobenzene.

IT 1478-61-1, 4,4'-(Hexafluoro isopropylidene) diphenol  
 RL: TEM (Technical or engineered material use); USES (Uses)  
 (in nonaq. electrolyte based on  
 (fluoroisopropylidene)diphenol for lithium batteries)  
 RN 1478-61-1 HCAPLUS  
 CN Phenol, 4,4'-[2,2,2-trifluoro-1-(trifluoromethyl)ethylidene]bis-  
 (CA INDEX NAME)



IC ICM H01M010-40  
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
 IT 79-20-9, Methyl acetate 105-37-3, Ethyl propionate 109-60-4,  
 Propyl acetate 123-86-4, Butyl acetate 141-78-6, Ethyl acetate,  
 uses 462-06-6, Fluorobenzene 554-12-1, Methyl propionate  
 1478-61-1, 4,4'-(Hexafluoro isopropylidene) diphenol  
 RL: TEM (Technical or engineered material use); USES (Uses)  
 (in nonaq. electrolyte based on  
 (fluoroisopropylidene)diphenol for lithium batteries)

L27 ANSWER 4 OF 6 HCAPLUS COPYRIGHT 2008 ACS on STN  
 ACCESSION NUMBER: 2004:485903 HCAPLUS [Full-text](#)  
 DOCUMENT NUMBER: 141:40691  
 TITLE: Membrane-electrode structure for polymer  
 electrolyte fuel cell  
 INVENTOR(S): Fukuda, Kaoru; Tanaka, Ichiro; Tani, Masaki;  
 Matsuo, Junji  
 PATENT ASSIGNEE(S): Honda Motor Co., Ltd., Japan  
 SOURCE: Eur. Pat. Appl., 26 pp.  
 CODEN: EPXXDW  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 1429403	A2	20040616	EP 2003-26936	200311 25
JP 2004193106	A	20040708	JP 2003-360615	200310 21
JP 4130792	B2	20080806		
US 20040115502	A1	20040617	US 2003-720280	

## PRIORITY APPLN. INFO.:

JP 2002-341362

A

200311

25

200211

25

JP 2003-360615

A

200310

21

AB A membrane-electrode structure capable of exhibiting excellent elec. power generation performance even in a high current region and a polymer electrolyte fuel cell using the membrane-electrode structure are provided. Addnl., elec. appliances and transport machines each using the above-described polymer electrolyte fuel cell are provided. The membrane-electrode structure comprises an anode, a cathode and a polymer electrolyte membrane made of a sulfonated polyarylene based polymer and held between both electrodes. The cathode comprises an electrode catalyst layer containing a catalyst particle having the catalyst loaded on the carbon particles, a pore forming member and an ion conducting polymer falling within the weight ratio range from 1.0 to 1.8 in relation to the carbon particles, and is in contact with the polymer electrolyte membrane through the electrode catalyst layer. The electrode catalyst layer has a total sum volume of the pores falling within the pore diameter range from 0.01 to 30  $\mu\text{m}$ , of the pores formed by the pore forming member, equal to or more than 6.0  $\mu\text{L}/\text{cm}^2\text{-mg}$  catalyst. The pores formed by the pore forming member have a first peak falling within the pore diameter range from 0.01 to 0.1  $\mu\text{m}$

and a second peak falling within the pore diameter range from 0.1 to 1.0  $\mu\text{m}$ .

IT 122325-09-1DP, reaction products with phenoxy derivatized benzophenone, sulfonated  
 RL: DEV (Device component use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)  
 (membrane-electrode structure for polymer electrolyte fuel cell)

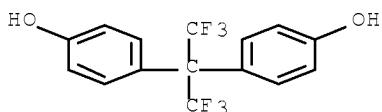
RN 122325-09-1 HCAPLUS

CN Methanone, bis(4-chlorophenyl)-, polymer with  
 4,4'-(2,2,2-trifluoro-1-(trifluoromethyl)ethylidene)bis[phenol] (CA  
 INDEX NAME)

CM 1

CRN 1478-61-1

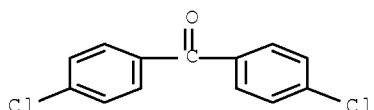
CMF C15 H10 F6 O2



CM 2

CRN 90-98-2

CMF C13 H8 Cl2 O



IT 122325-09-1P

RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation);  
 RACT (Reactant or reagent)  
 (membrane-electrode structure for polymer electrolyte  
 fuel cell)

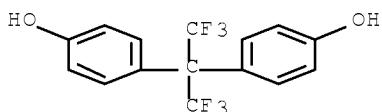
RN 122325-09-1 HCAPLUS

CN Methanone, bis(4-chlorophenyl)-, polymer with  
 4,4'-(2,2,2-trifluoro-1-(trifluoromethyl)ethylidene)bis[phenol] (CA  
 INDEX NAME)

CM 1

CRN 1478-61-1

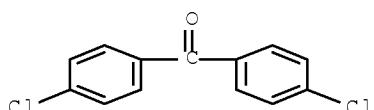
CMF C15 H10 F6 O2



CM 2

CRN 90-98-2

CMF C13 H8 Cl2 O



IC ICM H01M004-86

ICS H01M008-10

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
 Section cross-reference(s): 38

IT 122325-09-1DP, reaction products with phenoxy derivatized  
 benzophenone, sulfonated 463954-50-9DP, reaction products  
 bisphenol AF benzophenone oligomer, sulfonated

RL: DEV (Device component use); SPN (Synthetic preparation); PREP  
 (Preparation); USES (Uses)  
 (membrane-electrode structure for polymer electrolyte  
 fuel cell)

IT 122325-09-1P

RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation);  
 RACT (Reactant or reagent)

(membrane-electrode structure for polymer electrolyte

fuel cell)

L27 ANSWER 5 OF 6 HCPLUS COPYRIGHT 2008 ACS on STN  
 ACCESSION NUMBER: 2004:412649 HCPLUS Full-text  
 DOCUMENT NUMBER: 140:409652  
 TITLE: Method of fabrication of electrode structure for  
 polymer electrolyte fuel cell  
 INVENTOR(S): Hama, Yuichiro; Iguchi, Masaru; Yano, Junichi;  
 Kanaoka, Nagayuki; Mitsuta, Naoki  
 PATENT ASSIGNEE(S): Honda Motor Co., Ltd, Japan  
 SOURCE: U.S. Pat. Appl. Publ., 17 pp.  
 CODEN: USXXCO  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 20040096731	A1	20040520	US 2003-713146	200311 17
JP 2004186142	A	20040702	JP 2003-371834	200310 31
JP 2004186143	A	20040702	JP 2003-371835	200310 31
US 20070166594	A1	20070719	US 2007-723436	200703 20
PRIORITY APPLN. INFO.:			JP 2002-333566	A 200211 18
			JP 2002-334302	A 200211 18
			JP 2003-371834	A 200310 31
			JP 2003-371835	A 200310 31
			US 2003-713146	A3 200311 17

AB There is provided an electrode structure for a polymer electrolyte fuel cell having excellent power generation performance and excellent durability and a method for manufacturing the same. Also provided is a polymer electrolyte fuel cell including the electrode structure and an elec. apparatus and a transport apparatus using the polymer electrolyte fuel cell. The electrode structure includes a polymer electrolyte membrane sandwiched between a pair of electrode catalyst layers containing carbon particles supporting catalyst particles. The polymer electrolyte membrane is made of a sulfonated

polyarylene-based polymer. The sulfonated polyarylene-based polymer has an ion exchange capacity in the range of 1.7 to 2.3 meq/g, and the polymer contains a component insol. in N-methylpyrrolidone in an amount of 70% or less relative to the total amount of the polymer, after the polymer is subjected to heat treatment for exposing it under a constant temperature atmospheric of 120° for 200 h. A catalyst paste containing catalyst particles and a polymer electrolyte is coated on a sheet-like support and dried to form an electrode catalyst layer containing a solvent in an amount in the range of 0.5% or less by weight of the total membrane. The electrode catalyst layers are thermally transferred and joined on both sides of the polymer electrolyte membrane.

IT 690268-39-4DP, sulfonated 690268-39-4P

RL: DEV (Device component use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)

(method of fabrication of electrode structure for polymer electrolyte fuel cell)

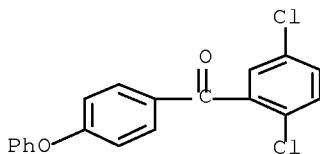
RN 690268-39-4 HCAPLUS

CN Methanone, bis(4-chlorophenyl)-, polymer with (2,5-dichlorophenyl)(4-phenoxyphenyl)methanone and 4,4'-[2,2,2-trifluoro-1-(trifluoromethyl)ethylidene]bis[phenol], block (9CI) (CA INDEX NAME)

CM 1

CRN 151173-25-0

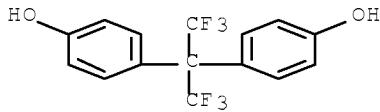
CMF C19 H12 Cl2 O2



CM 2

CRN 1478-61-1

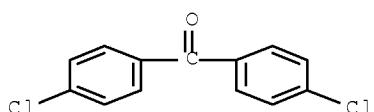
CMF C15 H10 F6 O2



CM 3

CRN 90-98-2

CMF C13 H8 Cl2 O



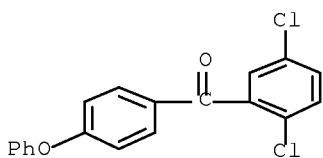
RN 690268-39-4 HCPLUS

CN Methanone, bis(4-chlorophenyl)-, polymer with  
(2,5-dichlorophenyl)(4-phenoxyphenyl)methanone and  
4,4'-(2,2,2-trifluoro-1-(trifluoromethyl)ethylidene)bis[phenol],  
block (9CI) (CA INDEX NAME)

CM 1

CRN 151173-25-0

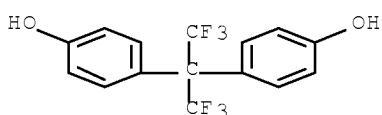
CMF C19 H12 Cl2 O2



CM 2

CRN 1478-61-1

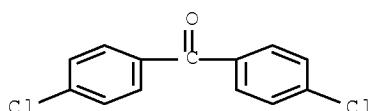
CMF C15 H10 F6 O2



CM 3

CRN 90-98-2

CMF C13 H8 Cl2 O



IT 122325-09-1P

RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation);

RACT (Reactant or reagent)

(method of fabrication of electrode structure for polymer



## PATENT INFORMATION:

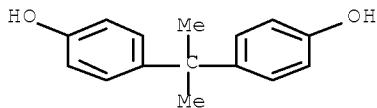
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
-----	-----	-----	-----	-----
US 2872362		19590203	US 1956-557626	
				195601
				05

AB To 1000 g. of 44% KOH, 5 g. of a hydroxytoluene is added. This may be cresol containing equal parts of o-, m-, and p-hydroxytoluene. The alkaline solution becomes cloudy when the hydroxytoluene is first added. The cloudy liquid is permitted to stand until a cloudy supernatant substance rises to the surface leaving a clear solution underneath which is then withdrawn. This clear aqueous solution has a lower surface tension than a solution containing KOH alone. When the clear solution is added to a Ag20-Zn battery, the battery has an improved output capacity and discharge voltage. The length of time required for soaking the battery electrode assembly in electrolyte before the battery can be charged is decreased in comparison with a similar battery using KOH alone as the electrolyte. This improvement is caused by improved wetting. The amount of hydroxytoluene is 0.1-2.0% of the electrolyte weight. The hydroxytoluene may be any one of the 3 isomeric forms. In another example, 5 g. p,p'-isopropylidenediphenol (Bisphenol A) was added to 1000 g. 44% KOH. The Ag20-Zn battery was heated to 75° for about 1 hr. before adding the electrolyte. When cooled to room temperature, the electrolyte solidified to a gel. The storage life of the battery was considerably improved and the capacity and discharge voltage were not impaired.

IT 80-05-7, Phenol, 4,4'-isopropylidenedi-  
(alkaline storage-battery electrolyte containing)

RN 80-05-7 HCPLUS

CN Phenol, 4,4'-(1-methylethylidene)bis- (CA INDEX NAME)



CC 4 (Electrochemistry)  
 IT 80-05-7, Phenol, 4,4'-isopropylidenedi- 95-48-7, o-Cresol  
 106-44-5, p-Cresol 108-39-4, m-Cresol  
 (alkaline storage-battery electrolyte containing)

=>